Strategic Plunger Spacing Techniques for Optimization of Rod Pump Wells

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HYDRALIFT RMOW
Strategic Plunger Spacing

- The act of adjusting your polished rod clamp at surface to allow your plunger to travel as close to the bottom of the barrel as possible, WITHOUT, tagging the pump.

- Strategic spacing optimizes a pump’s efficiencies by mitigating several downhole issues and increasing compression in the pump.

- Accurately spaced pumps handle gas more effectively, reduce scale deposition, and can increase daily production averages.

- Strategic plunger spacing saves time and increases pump life for operation companies.
Mitigation of Common Issues

- **Common Pump Issues to Discuss**
- Gas Interference
- TV closure issues
- Worn pump barrel
- Scale Deposition in Compression Chamber
- Tagging Pump
Gas Interference

- Decrease casing pressure

- Change BHA for better gas separation or use VSP

- Use strategic plunger spacing to remove dead space

- Decrease SPM if FL will allow
Tagging Pump at Bottom

- Lower SPM if FL will allow
- Raise rods to remove tag
- Card suggests 6” should suffice
- Raise rods by lowering polished rod clamp – OR –
- Install 6” Spacer safely from the ground and check for tag
Stuck Open TV

- Tag pump to remove solids from TV cage. A strategically spaced plunger can be tagged easily with very little time or cost. Once pump action is regained, raise rods to remove the tag. **DO NOT LEAVE TAGGING.** Tagging reduces pump life and adds extra stress to rods and surface equipment. The Hydraulic lift system allows operators the time it takes to do things right.
Worn Pump Barrel

- Strategically space the plunger to lower position in pump barrel. Extend pump life and increase production.
- In high solids wells, the top of the barrel and plunger wear out first.
- Increase SPM if Rod, Pumping unit and FL allow.
Scale Deposition in Pump

- Plunger is about to stick due to scale
- Raise rods to avoid deposition area
- Reduce SPM to remove fluid pound
- Revisit or initiate chemical treatment plan
Hydraulic Lifting Devices

- The Hydralift is a hydraulic rod lifting device used to replace conventional rod lifting methods. It allows a single operator to adjust pump spacing on a rod pump well safely, easily, and more efficiently.

- Synchronized hydraulic pistons transfer the weight of the rod string off of the pumping unit carrier bar and onto the wellhead. Once the device has lifted the rods enough to create a space between the carrier bar and the permanent clamps, a spacer is installed.

- Use the spacer pole to install a spacers in the necessary length. The synchronized hydraulic pistons then transfer the weight of the rod string back onto the carrier bar.
TRADITIONAL METHOD

- Shut down unit
- Set brake
- Engage pawl
- **Lockout/Tagout**
  - Remove pollution control device
  - Insert toadstool or suitcase
  - Clean polished rod surface
  - Attach bottom clamp
  - Torque clamp
- **Remove Lockout/Tagout**
  - Disengage pawl
  - Disengage brake
  - Roll over unit (high stress on motor)
- **Lockout/Tagout**

- Engage brake
- Engage pawl
- Remove top clamp (dangerous pinch point)
- Lower and attach top clamp (dangerous with unsure footing)
- Torque top clamps
- **Remove Lockout/tagout**
  - Disengage pawl
  - Disengage brake
  - Roll over unit (high stress on motor)
- **Lockout/tagout**
  - Engage brake
  - Engage pawl
  - Remove lower clamp
  - Remove toadstool or suitcase
  - Replace pollution control device
  - **Remove Lockout/tagout**
  - Disengage pawl
  - Disengage brake
  - Repeat if not spaced correctly
JSA Comparison

HYDRAULIC LIFT SYSTEM

• Shut down unit
• Set brake
• Engage pawl
• Lockout/Tagout
• Remove pollution control device
• Insert Lifting Device
• Attach bottom clamp
• Raise hydraulics
• Insert spacer (from a safe distance)
• Lower hydraulics (no impact on unit or rod string)
• Remove bottom clamp
• Remove Lifting Device

• Remove Lockout/Tagout
Lift Ratings

- The Hydralift and spacers have been tested by a third party lab to the highest standards and is rated to safely lift a total weight of 40,000lbs with a built in safety factor of 50%.

- The hoses, fittings, cylinders & pump are rated to a safe working load of 10,000psi.

- Designed to work on a variety of stuffing box styles.

- Permanent spacers are designed and manufactured for long life, high weight capacities and efficiency.
Hydraulic Pump

The hydraulic pump’s 10000 PSI capacity, and powerful 0.37 kw motor and 28 volt lithium-ion battery deliver exceptional speed and run time.

This allows operation of the hydraulic pump anywhere at any time.
Permanent spacers are designed in 3”, 6”, and 9” sizes. The teardrop design allows for easy removal or insertion of the spacer.
The spacer pole/pawl engager was designed to lift the permanent spacers into position or remove them easily. This allows the operator to stand safely on the ground with no additional equipment.
Operational Video
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